

REDUCE ENERGY...GET PAID

2004 Season

ELECTRICITY BIDDING PROGRAM PAYS CUSTOMERS WHO CONSERVE

Customers in New York State can reduce their electricity costs by becoming involved in New York State's electricity market through the Day-Ahead Demand Response Program (DADRP). Participating in this program helps reduce system demand, and pays market prices for load reduction.

This summer, commercial and industrial electricity consumers can register for DADRP service through any qualified program provider, such as a regulated utility, energy service company or curtailment service provider. To find out more about these providers, see the box at the bottom of this page.

HOW DADRP WORKS

The program works like this: customers specify the hours of the next day they would be willing to reduce electricity use, the amount of that reduction, and the

compensation required. That bid is submitted by the DADRP provider to the New York Independent System Operator (NYISO) by a program provider. The bid is then evaluated by NYISO and compared with supply bids submitted by generators. If a demand-reduction bid is selected, or **scheduled**, NYISO expects the customer to reduce consumption during the appointed time. In turn, the customer is paid the day-ahead market-clearing price for the demand-reduction amount scheduled. If the customer does not reduce its load as scheduled, consumption during the scheduled curtailment is billed at the higher of the day-ahead price or the real-time price.

This brochure outlines the basics of the New York State electricity market, provides guidelines on how to develop a demand-reduction bid and illustrates potential benefits based on last summer's market prices.

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DADRP is offered through regulated utilities and qualified program providers. To find out more about providers in your area, contact the New York State Public Service Commission toll-free at 1-877-661-9223 or on the web: www.AskPSC.com or www.dps.state.ny.us/eschoice.htm

Contact NYSEERDA toll-free at 1-866-NYSEERDA (1-866-697-3732), visit NYSEERDA's website at www.nyserda.org/demandresponse.html or send e-mail to info@nyserda.org

NEW YORK STATE ELECTRICITY MARKET BASICS

New York State's wholesale electricity market is managed by NYISO or ISO (eye-so). Each morning, NYISO accepts offers from generators that expect to have energy to sell the following day. NYISO also records bids to buy from utilities and other retailers purchasing energy to meet their customers' next day's needs. After sorting the offers according to price,



lowest to highest, NYISO develops a schedule by selecting supply offers in order until all purchase requests are met with sufficient supply to maintain system reliability. The last supply offer scheduled sets the price that buyers pay and that sellers receive. It is therefore called a last-price auction. Until now, this market has been open only to traditional energy supply and retail firms. Now, customers have access to this marketplace.

PRICES

New York State is divided into 11 zones for the purpose of setting wholesale prices. The zonal boundaries represent transmission system interfaces. Like a highway during rush hour, the transmission system can get congested when energy demands are high and electricity is re-routed to different parts of the State. The wholesale market-clearing price, called the locational based marginal price (LBMP), reflects the state of the transmission system when generators are selected to meet demand. Thus, it is possible for one zone to see dramatically different prices than an adjacent zone. Pages 6 and 7 show examples of how zonal price differences affect potential benefits of DADRP program participation.



NOTICE

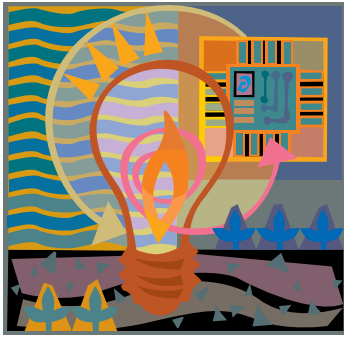
This informational brochure was prepared by Neenan Associates for NYSERDA as an introduction to NYISO's Day-Ahead Demand Response Program (DADRP). The Demand Reduction Strategies table on page 8 was prepared by Taitem Engineering for NYSERDA. Neither NYSERDA, its members, nor any person acting on their behalf: (a) makes any warranty, express or implied, with respect to the use of any information, apparatus, method or process contained, described, or referred to herein or that such use may not infringe privately owned rights; or (b) assumes any liabilities with respect to the use of, or for damages resulting from the use of, any information, apparatus, method or process contained, described or referred to herein.

The details in this NYSERDA brochure are accurate as of the time of printing, but are subject to change. For final program rules and procedures, contact the Market Relations Department of NYISO: (518) 356-6060 or check the NYISO website: www.nyiso.com/services/documents/manuals.

As with any market, a certain level of risk is associated with a transaction. To effectively assess risk of a transaction or bid, a participant should develop a familiarity and knowledge of the market and its principles. Analysis supporting the calculation of potential benefits referenced herein is available at www.bneenan.com

DAY-AHEAD BIDDING PROGRAM OVERVIEW

DADRP bids are evaluated in NYISO's Day-Ahead market every day at 5:00 a.m. The LBMPs for the next day are calculated and posted by 11:00 a.m. In the zone where the demand reduction was scheduled, NYISO pays the provider the greater of the bid price or the day-ahead LBMP. Payments by providers to customers for load curtailment bids may be lower as a result of administrative fees. Program features listed below may vary by provider. Check with your provider (see last page) for details.



ELIGIBILITY REQUIREMENTS

LOAD REDUCTION

Most providers require that customers be able to reduce their use (load) by a minimum of 100 kW per facility in each hour of the bid.

METERING

A New York State-approved hourly interval meter is required to participate. Discounts on approved meters may be obtained through NYSERDA (see the NYSERDA program table on page 8).

ON-SITE GENERATION

For 2004, no generation is permitted to participate in DADRP.

BIDDING

Customers should work with their provider to structure a DADRP bid, which includes the following information:

AMOUNT OF REDUCTION

Most providers require that customers be able to reduce load by a minimum of 100 kW per facility in each hour of the bid. There may be additional requirements regarding bid increments.

START TIME AND DURATION

Bids for consecutive hours of load reduction are called **strips**. Some providers may permit customers to specify the hours of bid strips, while other providers may standardize the hours for which bids may be submitted. Most providers require that the same reduction amount be bid in each hour of a strip.

BID PRICE

This is the price at which the customer is willing to reduce load. Some program providers may offer structured bids within which the bid hours (strip) and bid price are predetermined.

CURTAILMENT INITIATION COST

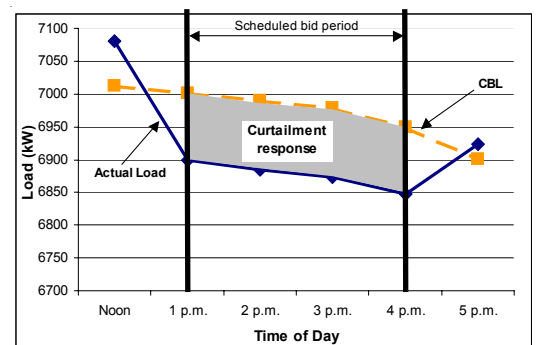
Some program providers allow customers to bid both a price for each hour's load reduction bid and an additional amount, called the curtailment initiation cost (CIC). The CIC places a floor on the total payment received if the bid is accepted. Ask your program provider about the availability and application of this feature.

SETTLEMENT

Any customer unable to reduce load by the bid amount during the scheduled time will pay the higher of the day-ahead price or the real-time price for the amount of the incomplete scheduled load reduction.

PERFORMANCE

Penalty rates are applied to the difference between the customer's Customer Baseline Load (CBL) assigned to each hour of the bid period, and its metered use in that hour. The CBL represents the customer's average level of use, during the time period equivalent to that of the curtailment bid period, during the 10 days prior to the day the bid was submitted. See NYISO's DADRP Procedures Manual for details on the CBL calculation.



The chart above shows how a customer performed when its bid was accepted for load reduction between 1:00 p.m. and 4:00 p.m. At noon, customer use was above CBL. At the beginning of the scheduled bid period, actual load fell below the CBL. The shaded area represents curtailment response.

DEVELOPING YOUR DEMAND-REDUCTION BID

BID PRICE

Lower bid price means more scheduled curtailment events

The market-clearing price frequency tables on the next page illustrate the frequency of different price levels. The lower the bid price, the greater the chance that the bid will be accepted.

BID PERIOD

Follow the price distribution

The market-clearing price frequency tables on the next page indicate how price levels relate to hours of the day, based on prices for the summer of 2003. It is important for customers to match their curtailment capability with the price distribution to maximize benefits.

BID DURATION

Assess the length of curtailments

The length of a curtailment strip bid will be affected by your load reduction capability. For example, if a mechanical process must be shut down for several hours before it can be restarted, why submit a single-hour curtailment when you could bid for the entire time of the process shutdown? Understanding any restrictions your load-reduction plan places upon your business operation should allow you to determine an appropriate bid period.

BID SUBMISSION

Be aware of bid submission deadlines and options for changing bids

Your provider will specify the level of bid detail, frequency, advance notice, and submittal method required to prepare a bid for submission to NYISO. If the provider requires bids to be submitted for more than one day at a time, ask whether you are able to revise your bids and how often they may be revised.

BID FREQUENCY

Bid often enough to benefit

The NYISO monitors the frequency of bids to ensure that eligible bidders are actively using the opportunity made available to them through DADRP. Infrequent bidding may jeopardize eligibility.

BURNOUT EFFECT

Too many scheduled curtailments

The table below indicates the number of times the price rose above \$100/MWh for a four-hour period over two consecutive days during the summer between the hours of 1:00 p.m. and 4:00 p.m and during the winter between 4:00 p.m. and 7:00 p.m. If it would be difficult to reduce load for consecutive days and you are located in a zone where prices may be high for more than one day at a time, structure your bids to limit exposure to this situation otherwise you could be scheduled for more curtailments than anticipated.

Frequency of two consecutive weekdays where the average day-ahead LBMP was equal to or greater than \$100/MWh for four consecutive hours				
	Upstate	Hudson Valley	New York City	Long Island
	(Zones A - E)	(Zones F - I)	(Zone J)	(Zone K)
Summer	0	3	14	8
Winter	7	13	35	32

CURTAILMENT INITIATION COST

Ensure a minimum level of benefit

Customers may bid a curtailment initiation cost (CIC) to supplement hourly bid prices for demand-reduction bids. If your bid is scheduled, the CIC payment is guaranteed, regardless of the level of the LBMPs. If applying the LBMPs to the demand-reduction bid amount results in a higher benefit, then that higher amount is paid by NYISO.



PRICE LEVEL FREQUENCY

The graphs below show the number of times the Day-Ahead LBMP prices in each of the four major price zones were at different levels during the day for the summer, May 1 through October 31, based on price data from 2003.

For example, in zone K for hour 16, prices were in the \$100-\$149 range 17 times, in the \$150-\$199 range once, and did not exceed \$200.

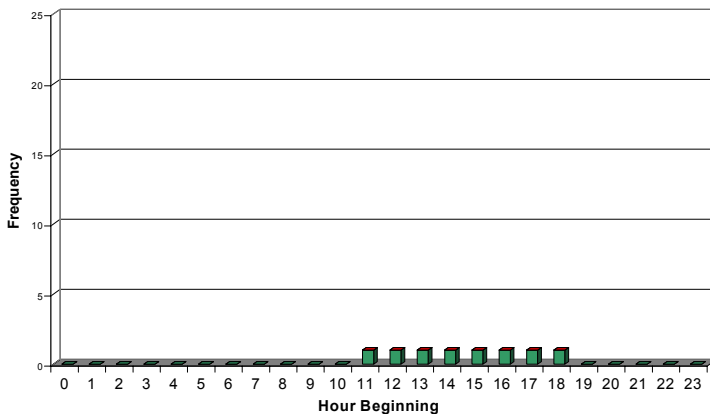
LBMP Range

- \$200+
- \$150-\$199
- \$100-\$149

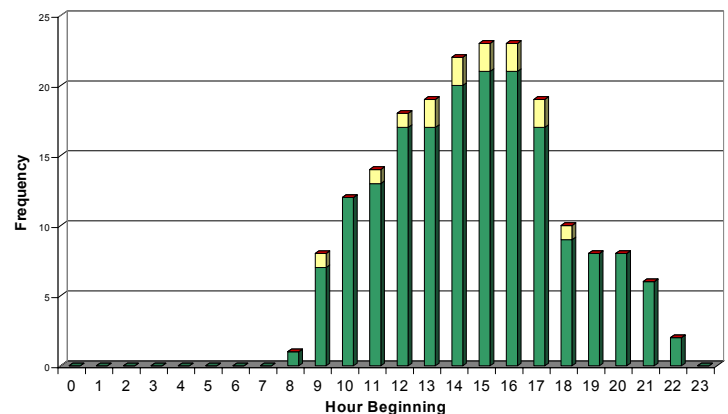
PRICE LEVEL FREQUENCY - SUMMER

The four graphs below illustrate the distribution of prices. The nine upstate NYISO pricing zones have been aggregated into two regional areas, Upstate and Hudson Valley, since prices vary little within them. Higher prices occur more frequently in the mid-hours of the day, but there is variation among the zones. The data from summer 2003 suggests that bids in early morning or late evening hours would yield significantly lower benefits.

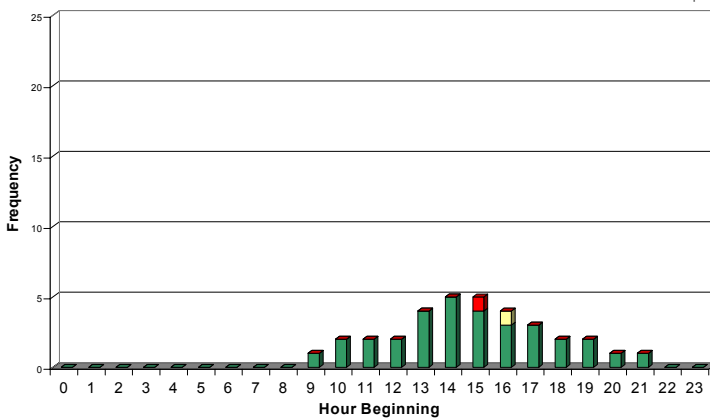
UPSTATE
(ZONES A - E)



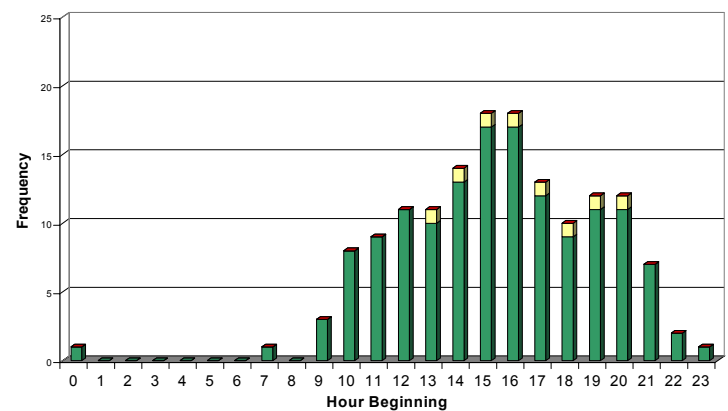
NEW YORK CITY
(ZONE J)



HUDSON VALLEY
(ZONES F - I)



LONG ISLAND
(ZONE K)



PRICE LEVEL FREQUENCY - WINTER

For the winter 2003 months (not illustrated), prices tended to be slightly higher. Moreover, prices above \$100/MWh only last two to four hours, and occur later in the afternoon, between 4:00 p.m. to 7:00 p.m.

POTENTIAL BENEFITS SUMMER SEASON*

When a load reduction bid is accepted, the benefits from participating in DADRP are based on the bid price and load reduction amount, and the day-ahead locational based marginal price (LBMP) in the customer's price zone. Check with your program provider to determine which zone you are located in.

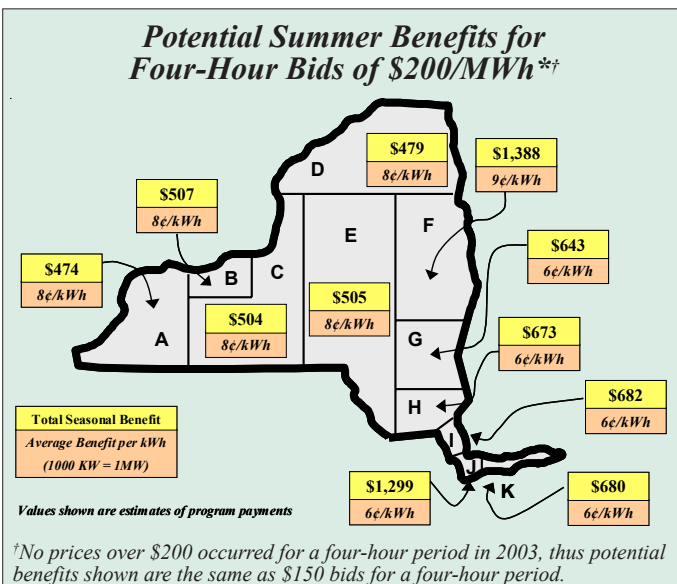
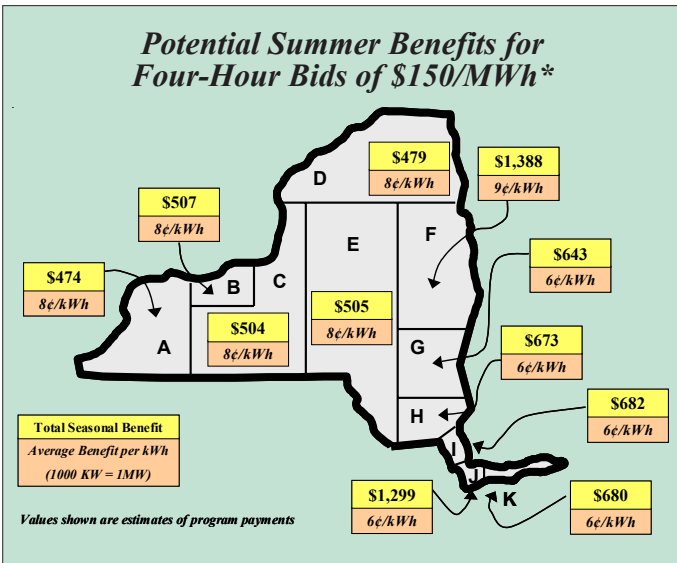
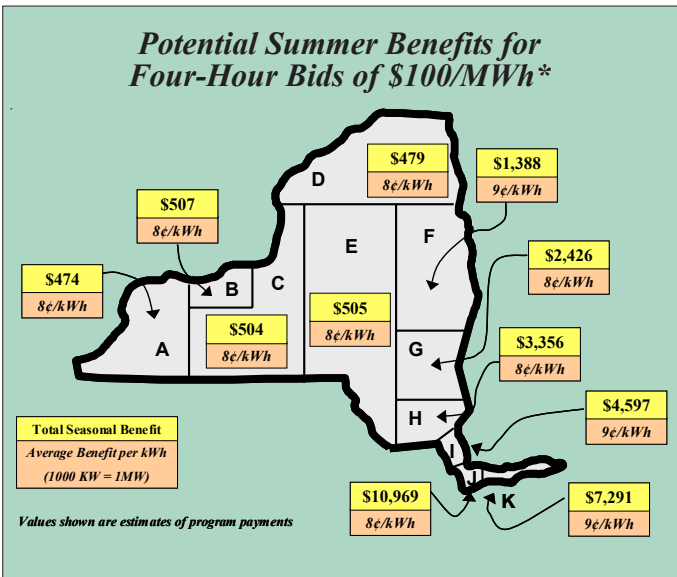
The maps on the left show the potential benefits of a 1 MW bid in each price zone using NYISO price information from the summer of 2003. The benefits shown represent the value of four-hour strip bids for each zone during the summer of 2003, assuming that they were accepted by NYISO and complied with by the customer. Actual benefits will vary due to a number of factors, including weather, generation plant availability, system demand, and the provider's terms for payment.

SUMMER BID EXAMPLE

The table below illustrates how the potential summer benefits for strip bids were calculated. In the example, 1 MW of load reduction was assumed to have been bid at the price of \$100 for each hour in the strip, and the bid was scheduled. The day-ahead LBMP values are for zone F on August 18, 2003. Because the LBMP is higher than the bid price, it is used in the DADRP payment calculation, which totals \$521 for the strip. The table also displays the total potential summer benefit for bids of \$100/MWh in zone F.

FOUR-HOUR BID FOR 1 MW AT \$100/MWH

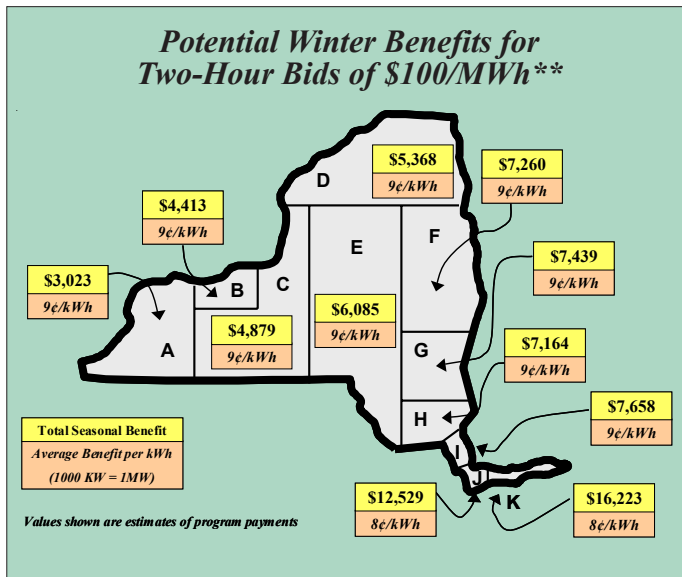
Hour Beginning	Load Reduction	Bid Price	Day-Ahead LBMP	DADRP Payment
1 p.m.	1 MW	\$100	\$125	\$125
2 p.m.	1 MW	\$100	\$131	\$131
3 p.m.	1 MW	\$100	\$134	\$134
4 p.m.	1 MW	\$100	\$131	\$131
One-day potential benefits for this bid in zone F on August 18, 2003*				\$521
Total potential summer benefits for this 1 MW bid at \$100/MWh in zone F*				\$1,387



* Potential benefits shown are based on NYISO historical price data from May 1 through October 31, 2003.

Example of the \$100/MWh, four-hour bid strip used to evaluate potential benefits in zone F for a single day and the entire summer season.

POTENTIAL BENEFITS - WINTER SEASON**



Winter demands for electricity vary by location, and are typically lower than summer demands. To maximize DADRP benefits during the winter, consider shorter bid durations and lower bid prices. Minimum bid duration and bid price features may vary based on the provider's program.

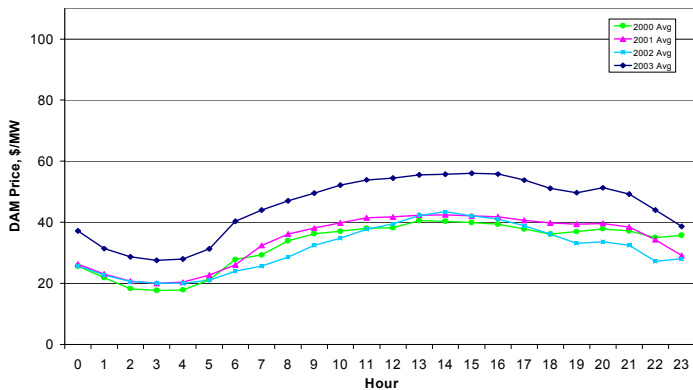
The map above shows the potential benefits for a bid of 1 MW in each price zone using NYISO price information from November 1, 2002 through April 30, 2003.

** Potential benefits shown are based on NYISO historical price data from November 1, 2002 through April 30, 2003.

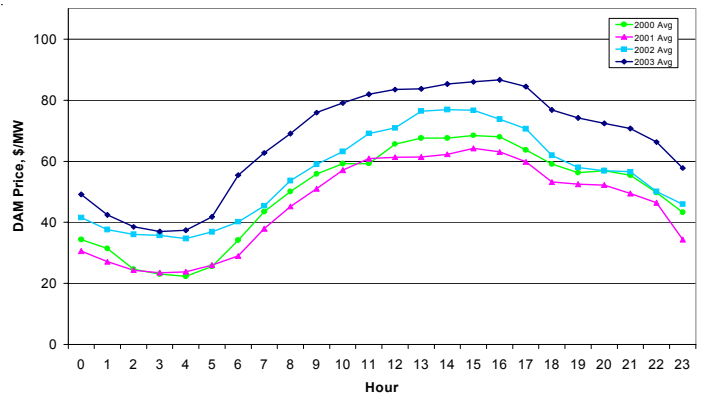
AVERAGE DAY-AHEAD WEEKDAY PRICES SUMMER SEASONS 2000 - 2003

The charts below illustrate the average day-ahead weekday price per hour for the summer seasons of 2000, 2001, 2002 and 2003. Average prices vary by hour and year due to a number of factors, including weather, generation plant availability, and system demand.

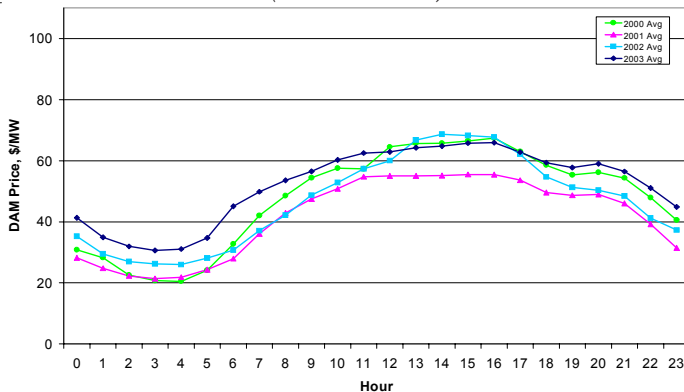
UPSTATE
(ZONES A - E)



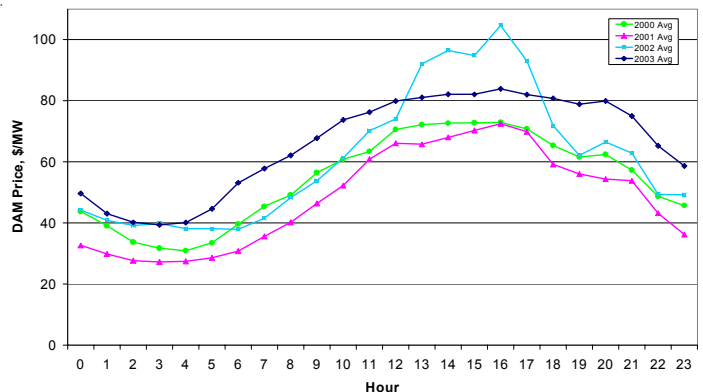
NEW YORK CITY
(ZONE J)



HUDSON VALLEY
(ZONES F - I)



LONG ISLAND
(ZONE K)



DEMAND REDUCTION STRATEGIES

The table below describes some low-cost and no-cost strategies that can be used to temporarily lower electrical load in office buildings. Example energy savings are based on a 50,000 square foot building.

Demand Reduction Measure	Watts per square foot	Preparation	Implementation	Issues
TURN OFF 50% OF LIGHTS	0.64	Check whether current switching allows lights to be turned off without causing under lighting. Table lamps may be used for task lighting if needed. Label switches that are to be turned off during declared events, and have table lamps available.	At the beginning of the event, turn off half the lights in office areas and anywhere lighting can be reduced without disrupting normal activities.	Evaluate the suitability of this measure based on activities in the building. Requires cooperation from employees/tenants. In office areas, turning off half the lights typically results in an illumination level of 25 foot-candles, which should be acceptable, especially where computer work is the predominant activity.
REDUCE CHILLER CAPACITY	0.45	Investigate options for running chiller(s) at reduced capacity. Various modes of capacity reduction are available. Use energy-management system, if available to reduce capacity. The hot-gas bypass approach is not recommended.	Reduce chiller capacity by 10-20% during the declared event.	To avoid comfort control problems, implement this measure in conjunction with actions that reduce the cooling load, for example, reduced lighting, raising thermostat setting, reduced ventilation.
REDUCE AIR HANDLER AIRFLOW	a0.21	Confirm that air-handler motor can be run at reduced speed. Use energy-management system, if available, to reduce motor speed. If the air-handler motor is constant speed but has multiple-speed taps in the motor, a control relay can be used to shift operation to low speed.	Reduce airflow by 10-20% during the declared event.	This measure should be implemented in conjunction with actions that reduce the cooling load, for example, reduced lighting, raising thermostat setting, reduced ventilation. There may be some loss of comfort due to diminished air movement.
TURN OFF LIGHTS BY WINDOWS	0.21	Label switches for lights near windows that are to be turned off during declared events, and have table lamps available.	At the beginning of the event, switch off the lights near windows.	Feasibility and savings will vary depending on available daylight and lighting-system wiring. This measure is only practical where wiring permits switching off perimeter lights without eliminating necessary interior lights.
TAKE 50% OF ELEVATORS OFF DUTY	0.17 34000 watts per elevator	Consult life-safety code for buildings with special health/safety requirements.	Manually turn off no more than one out of every two elevators for the duration of the event. Place "out of service" signs on each floor.	This load-reduction may cause some inconvenience, although many offices do not have high elevator traffic at times of peak demand (12 noon to 4 pm). If a longer wait time for an elevator will interfere with health and safety, it should not be shut off.* <small>*Note: applies to traction elevators, not hydraulic elevators</small>
REDUCE EXHAUST AND OUTDOOR-AIR VENTILATION	0.14	Confirm that the building does not appear to be underventilated (e.g., occupants do not complain about stuffiness). Determine how outdoor-air damper is controlled. Inventory exhaust fans and identify any that should not be turned off. Consider mitigating negative effects by increasing the outdoor-air ventilation rate slightly during the time before the demand-reduction event.	Reduce outdoor-air intake during the declared event. Turn off exhaust fans that serve bathrooms, janitor's closets, conference rooms, and other non-critical spaces. Do not turn off garage exhaust or other fans that exhaust harmful contaminants.	Reducing outdoor-air ventilation for a four-hour period should not produce excessive stuffiness unless the building is already underventilated (in which case a 25% reduction will not significantly reduce demand). Shutting off exhaust fans may cause some increase in odors, although this should be minimal over a four-hour event.
RAISE THERMOSTAT SETTING 6° F	0.12	Determine how temperatures are controlled at the site. Consider announcing a relaxed dress code for days when demand reduction events are anticipated.	If an energy-management system is available, reprogram to change the setpoint during the declared event. Otherwise, manually adjust wall-mounted thermostats.	This change in temperature setting may be uncomfortable for some people. Overheating can be minimized by cooling the building slightly below its normal setpoint in the hours before the demand reduction event.
TURN OFF WATER COOLER/HEATERS	0.07	Identify locations of water cooler/heatens and prepare labels so employees/tenants do not turn them on again.	Unplug or shut off units during the declared event.	Loss of convenience.
TOTAL	2.01			

NYSERDA PROGRAMS

The New York State Energy Research and Development Authority (NYSERDA) offers a variety of programs, including the Peak-Load Reduction and Enabling Technology for Price Sensitive Load Management programs, to facilitate participation in new demand-reduction initiatives and other conservation programs. For more information, call NYSERDA toll-free at 1-866-NYSERDA (1-866-697-3732) or visit NYSERDA's website at www.nyserdera.org/demandresponse.html



Program	Project Manager	E-Mail	NYSERDA Extension
Peak-Load Reduction Program (including metering)	Chris Smith	cjs@nyserdera.org	3360
Enabling Technology for Price Sensitive Load Management	Peter Douglas	pwd@nyserdera.org	3214
Manufacturing Assistance for Peak Shaving (MAPS) Program	Bill Reinhardt	wwr@nyserdera.org	3257
Residential Comprehensive Energy Management (CEM) Services	Ed Morrison	ewm@nyserdera.org	3362
Commercial and Industrial Performance Program	Eric Mazzone	efm@nyserdera.org	3371